

the two races appearing under these names in the A. O. U. list are united, while two races of *islandus* are recognized from Greenland.

The use of *Colymbus* for the Loons and *Ænanthe* for the Wheatear is correct as already stated in these columns and must be followed by the A. O. U. Committee.

It is matter for general congratulation that three Committees, working independently, have been able to come to such close agreement on all matters covered by the International Code of Nomenclature, and the differences that still remain emphasize the fact that it is no longer questions of nomenclature but of taxonomy that cause diversity in names.

The Committee of the B. O. U. deserve to be congratulated upon the excellent piece of work that they have accomplished and, with the exception of the unfortunate thirteen *nomina conservanda*, we can heartily recommend the nomenclature of the new list to all who write on British birds.— W. S.

Hankin on Animal Flight.¹— No ornithological problem has caused so much speculation, even from the earliest times, as the soaring bird; to quote Sir Guilford Molesworth, although “many theories have been advanced . . . they have all been miserably insufficient”; while even Lord Kelvin admits: “That which puzzled Solomon puzzles me also.” Practically everyone who has written on the matter has had a theory and the literature of the subject as a whole may be said to consist of a maximum of explanation with a minimum of observation. It is therefore a gratification to find a work that is almost exclusively devoted to observation, such as Dr. Hankin has produced,— observations moreover of the most detailed and careful kind which constitute one of the most valuable contributions to the subject of flight which has ever appeared.

The need of such a record of observation is recognized by the author who says by way of introduction: “Those best qualified to form an opinion have as a rule had little or no opportunity of studying the facts at first hand. Such authorities have, in some cases, published accounts of soaring flight which have consisted entirely of explanation. Others have related a few facts with more or less tentative explanations. The present book will be found to contain the facts of the case with no explanation at all.”

Dr. Hankin's observations were carried on mainly at Agra, India, where the opportunities for the study of soaring flight — always best seen in the tropics — were excellent. His records show that there is a definite time each day when soaring becomes possible, which is earlier as the season advances. The presence of either wind or sunshine is an absolute necessity

¹ Animal Flight. | A Record of Observation. | By | E. H. Hankin, M. A., Sc.D. | Late Fellow of St. John's College, Cambridge, | Honorary Fellow of Allahard University, | Chemical Examiner and Bacteriologist to | the Government of the United Provinces | and of the Central Provinces, India, Associate Fellow of the Aeronautical Society of | Great Britain. | (First Edition) | London: | Iliffe & Sons Ltd., 20, Tudor Street, E. C. | [1913?] Svo. pp. 1-405 + Index unpagged. Price, 12s. 6d.

for soaring, but it is an undisputable fact that soaring is possible when there exists, so far as it is possible to determine, a perfect calm.

With the idea that the sun's heat possibly caused ascending currents in the air Dr. Hankin made extended observations along this line, with the result that the time of appearance of "heat eddies" indicating upward air currents was found to coincide almost exactly with the time of the beginning of soaring.

He found, on the other hand, however, that "heat eddies" not directly caused by the sun had no relation to the "soarability" of the air and that when the solar energy that causes "heat eddies" was held back by thin clouds, soaring continued, uninterrupted.

Ordinary ascending air currents from "heat eddies," therefore, seemed not to be the basis of soaring nor did they seem sufficiently powerful, and he concludes "if soarability is due to ascending currents caused by the sun's rays, these currents must resemble heat eddies in being widely and apparently uniformly distributed," but "they must differ in containing a great deal more energy and in being as yet undiscovered."

Mr. William Brewster's observations on Gulls sailing into the teeth of the wind, near an advancing vessel were duplicated in Dr. Hankin's experience. He says the Gulls were observed in the usual "soarable area" on the leeward side of the stern and also "gliding ahead of the ship in a head wind, keeping the same speed for minutes together. Sometimes they kept at a distance of only a few feet from the bridge and so under the best condition for observation and yet no trace of any movement of the wings could be observed." He adds "were these cases of the soarable area being greatly extended or was the air uniformly soarable under the tropical sun?" Mr. Brewster's observations go to disprove the latter suggestion as they were not in the tropics.

The evidence that Dr. Hankin has gathered seems to indicate that "besides the effect of the air disturbance caused by the motion of the ship another factor of importance is the nature of the wind . . . some winds are soarable and other winds are not soarable. Apparently in both cases some unknown factor affecting soarability is involved."

Dr. Hankin's observations are not limited to soaring birds but cover the whole field of flight as the following chapter headings will show: 'Preliminary Description of Soaring Flight'; 'Preliminary Account of the Conditions Necessary for Soaring Flight'; 'Preliminary Account of Directive Movements in Gliding Flight'; 'On Conditions Affecting Sun Soarability'; 'A Further Description of Steering Movements'; 'Metacarpal Descent'; 'Arching'; 'Functions of the Tail'; 'Flapping Flight'; 'Lateral Stability'; 'Position of Centre of Gravity'; 'The Flight of Bats'; 'The Flight of Flying Fishes'; 'The Flight of Sea Gulls'; 'Ascending Currents'; 'Wind Soarability'; 'Soaring in Stormy Winds'; 'Colour Phenomena of Soaring Flight'; 'Relative Efficiency of Different Wing Forms in Respect to Soaring Flight'; 'On the Flight of Dragon-flies'; 'Glossary'.

In turning over the pages of Dr. Hankin's volume one is astonished at

the extent of his observations. No factor that could possibly affect flight seems to have been overlooked and data have been collected in regard to meteorology and along other side lines with as much care as in studying the actions of the birds. A clever method of plotting the track of a bird soaring high in air was devised by tracing the movements of the bird on the surface of a horizontal mirror, with copying ink, from which impressions could readily be transferred to paper. A series of dots, instead of a continuous line, each dot corresponding to the tick of a metronome, gave in addition, the speed of the bird when the altitude had been ascertained.

The book is well worthy of the attention of every one interested in bird flight, whether or not he be inclined to supply the explanations which Dr. Hankin refrained from attempting, and unlike most treatises on flight it will be found entirely free from technical terms or mathematical formulæ.—
W. S.

Snethlage's 'Catalogue of the Birds of Amazonia.'¹—Dr. Snethlage's contributions to the ornithology of the Amazon region are well known to students of neotropical birds and her knowledge of the entire avifauna as well as her familiarity with many parts of the country fit her admirably for the task which she has just brought to a conclusion.

The catalogue consists of the technical and vernacular name of each species with references, a statement of range, a list of the specimens in the Museu Goeldi, with localities, and a description of the male and female. Under each genus is a key to the species, and under orders and families, keys respectively to the families and genera. Plates of the heads and feet of representatives of the principal groups accompany the general key to the orders. The work is, as will be noticed, intended to serve two purposes— as a manual for resident bird students and as a work of reference for ornithologists in other parts of the world.

The text is naturally in Portuguese, but this does not detract from its value to foreign ornithologists, since to them the descriptions are of the least importance, and the localities and ranges are easily made out.

There are 1117 species included in the Catalogue which forms a most valuable contribution to South American ornithology. The recent activity in the study of South American birds has reached a stage where faunal works of this sort are badly needed to bring into systematic order the scattered work of numerous writers.

Dr. Snethlage writes us that the work was published in Germany and the copies intended for the American correspondents of the Museum were held in Hamburg when the war broke out. She requests us to announce that these will be forwarded as soon as possible.— W. S.

¹ *Catalogo das Aves Amazonicas contendo todas as especies descritas e mencionadas até 1913 pela Dr. Emilia Snethlage (com 6 estampas e 1 mappa). Boletim do Museu Goeldi (Museu Paraense) de Hist. Nat. e Ethnogr. Tomo viii, 1911/12. Para, Brazil. 1914. pp. 1-530.*